REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Claims 1, 3-25, 27-49, 51-73, 75-97, 99, 101, 103, 105, 107, 109, and 111 are pending. Claims 1, 3-15, 17-25, 27-39, 41-49, 51-63, 65-73, 75-87, 89-97, 99, 101, 103, 105, 107, 109, and 111 have been rejected. Claims 16, 40, 64, and 88 have been objected to.

Claims 1, 25, 49, 73, 97, 101, 105, and 109 have been amended. No claims have been canceled. No claims have been added. Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicant submits that the amendments do not add new matter.

Applicant reserves all rights with respect to the applicability of the Doctrine of Equivalents.

Applicant acknowledges with appreciation the Examiner's indication of allowance of claims 16, 40, 64, and 88 if rewritten in independent form including all limitations of the base claim and any intervening claims.

Claims 1, 3-8, 19-20, 25, 27-32, 43-44, 49, 51-56, 67-68, 73, 75-80, 91-92, 97, 99, 101, 103, 105, 107, 109, and 111 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,665,641 to Coorman et al. ("Coorman") in view of Banbrook "Nonlinear Analysis of Speech From a Synthesis Perspective" ("Banbrook").

Amended claim 1 includes "constructing a matrix W containing first data corresponding to the time samples from the portions surrounding the segment boundary within the phoneme and second data corresponding to the portions; and deriving feature

vectors that represent the portions in a vector space by <u>decomposing the matrix *W*</u>

<u>containing the first data corresponding to the time samples and the second data</u>

<u>corresponding to the portions surrounding the segment boundary within the phoneme.</u>

       Coorman discloses the following:

> One of the features used in the transition cost is the spectral mismatch between consecutive segments. The calculation of this spectral mismatch is based on a distance calculation between spectral vectors. This might be a heavy task as there can be many segment combinations possible. In order to reduce the computational complexity <u>a combination matrix--containing the spectral distances- could be calculated in advance for all possible spectral vectors occurring at diphone boundaries</u>. As the speech segment database grows this approach would require ever increasing memory. An efficient solution is to vector quantize (VQ) the set of possible spectral vectors occurring at diphone boundaries. Based on the results of this VQ, a distance lookup table can be constructed, whose size can be kept constant independent of the database size. Because the phoneme distribution is far from uniform it is appropriate to vector quantize on a phoneme-by-phoneme basis instead of performing a uniform VQ over the whole database. This process results in a set of phoneme-dependent VQ distance tables.

(Coorman, col. 18, lines 16-35)(emphasis added)

       Thus, Coorman discloses calculating a matrix containing the spectral distances. In

contrast, amended claim 1 refers to a matrix *W* containing first data corresponding to the

time samples from the portions surrounding the segment boundary within the phoneme

and second data corresponding to the portions surrounding the segment boundary within

the phoneme. Accordingly, Coorman fails to disclose constructing a matrix *W* containing

<u>first data corresponding to the time samples from the portions surrounding the segment</u>

<u>boundary within the phoneme and second data corresponding to the portions</u>, as recited in

amended claim 1.

       Accordingly, Coorman also fails to disclose <u>decomposing the matrix *W*</u>

<u>containing the first data corresponding to the time samples and the second data</u>

corresponding to the portions surrounding the segment boundary within the phoneme, as recited in amended claim 1.

Banbrook, in contrast, discloses producing the trajectory matrix **X** ((4.1)-(4.3), p. 37). More specifically, Banbrook the trajectory matrix containing the time series x_i data (p. 37, (4.1)-(4.2). Banbrook fails to disclose, teach, or suggest a matrix W containing first data corresponding to the time samples from the portions surrounding the segment boundary within the phoneme and second data corresponding to the portions surrounding the segment boundary within the phoneme, as recited in amended claim 1. Accordingly, Banbrook fails to disclose, teach, or suggest decomposing the matrix W containing the first data corresponding to the time samples and the second data corresponding to the portions surrounding the segment boundary within the phoneme, as recited in amended claim 1.

Furthermore, even if Banbrook and Coorman were combined, such a combination would still lack a matrix W containing first data corresponding to the time samples from the portions surrounding the segment boundary within the phoneme and second data corresponding to the portions, as recited in amended claim 1.

Therefore, applicant respectfully submits that claim 1, as amended, is not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Given that claims 3-8, 19-20, 25, 27-32, 43-44, 49, 51-56, 67-68, 73, 75-80, 91-92 contain the limitations that are similar to those discussed with respect to amended claim 1, applicant respectfully submits that claims 3-8, 19-20, 25, 27-32, 43-44, 49, 51-56, 67-68, 73, 75-80, 91-92 are not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Amended claim 97 includes "constructing a matrix containing first data corresponding to the time samples of the pitch periods surrounding the segment boundary within the phoneme and second data corresponding to the pitch periods and deriving feature vectors that represent the time samples in a vector space by decomposing the matrix containing the first data corresponding to the time samples of the pitch periods surrounding the segment boundary within the phoneme and the second data corresponding to the pitch periods".

As set forth above, even if Coorman and Banbrook were combined, such a combination would still lack a matrix containing first data corresponding to the time samples of the pitch periods surrounding the segment boundary within the phoneme and second data corresponding to the pitch periods surrounding the segment boundary within the phoneme, as recited in amended claim 97.

Therefore, applicant respectfully submits that claim 97, as amended, is not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Given that claims 99, 101, 103, 105, 107, 109, and 111 contain the limitations that are similar to those discussed with respect to amended claim 97, applicant respectfully submits that claims 99, 101, 103, 105, 107, 109, and 111 are not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Claims 9-10, 21-23, 33-34, 45-47, 57-58, 69-71, 81-82 and 93-95 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Coorman in view of Banbrook and in further view of Ansari et al., "Pitch Modification of Speech Using a Low-Sensitivity Inverse Filter Approach" ("Ansari").

Ansari, in contrast, discloses pitch modification of speech using a low-sensitivity inverse filter approach, and also fails to disclose the discussed above limitations of amended claim 1 or amended claim 97.

Furthermore, even if Coorman, Banbrook, and Ansari were combined, such a combination would still lack the discussed above limitations of amended claim 1 or amended claim 97.

Therefore, for at least the reasons that are similar to those reasons set forth above with respect to amended claims 1 or 97, applicant respectfully submits that claims 9-10, 21-23, 33-34, 45-47, 57-58, 69-71, 81-82 and 93-95 are not obvious under 35 U.S.C. § 103(a) over Coorman, in view of Banbrook, and further in view of Ansari.

Claims 11-15, 35-39, 59-63 and 83-86 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Coorman and Banbrook in view of Ansari and in further view of Bellegarda, "Exploiting Latent Information in Statistical Language Modeling" ("Bellegarda").

Bellegarda, in contrast, addresses relationships between words and documents. Bellegarda fails to disclose the discussed above limitations of amended claims 1 or 97.

Furthermore, even if Coorman, Banbrook, Ansari, and Bellegarda were combined, such a combination would still lack the discussed above limitations of amended claim 1 or amended claim 97.

Therefore, for at least the reasons that similar to those reasons set forth above with respect to amended claims 1, or 97, applicant respectfully submits that claims 11-15, 35-39, 59-63 and 83-86 are not obvious under 35 U.S.C. § 103(a) over Coorman, in view of Banbrook, in view of Ansari, and further in view of Bellegarda.

It is respectfully submitted that in view of the amendments and arguments set forth herein, the applicable rejections and objections have been overcome. If there are any additional charges, please charge Deposit Account No. 022666.

Respectfully submitted,
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